CLAIMS:

1. A radio antenna which is physically dimensioned to be less than ten percent of the intended operating wavelength, and in which the power to be transmitted is connected from a low impedance feeder via an inductive component, or a parallel set of inductive components, connected to a low impedance tap on a radio-frequency autotransformer which has a capacitive component connected to be in parallel resonance, the first inductive component or components being used to stimulate the principal in-phase radio-frequency magnetic field and the capacitive component being used to stimulate the principal in-phase electric field and the said two fields being placed so as to cross-stress the space surrounding the antenna in an interaction zone, the resonant circuit having the electric field in phase with the potential on the capacitive stimulator but in the said circuit the current fed to the resonant transformer being directed through parallel parts of a toroidal coil in order to stimulate the necessary in phase magnetic field thus resolving the criterion of in-phase electrical alternation of electric and magnetic fields.

2. A radio antenna according to Claim 1 which has an electric field stimulator which is a hollow cylinder with or without a sliding telescoping section within, held vertically above a toroidal magnetic stimulator mounted horizontally above a non-magnetic metal plane with its end connections connected to the said E-plate and the plane with or without a trimmer capacitor connected in parallel across the resonator coil.

3. A radio antenna according to Claim 1 or 2 with the electric field stimulator constructed as a hollow cone which is able to be moved so as to adjust its electrical capacity to the said terminating plane.

4. A radio antenna according to Claim 1 and either of Claim 2 or 3 with electric field stimulator constructed as a hollow cone electrically connected to a hollow cylinder either fixed to the said cone or in sliding contact with same.

5. A radio antenna according to Claims 1 and 2 or 1 and 3 in which either the electric field stimulator or the non-magnetic plane are shaped to apply the said field in a manner to produce non uniformly directed radiation.

6. A radio antenna according to Claim 1 in which the electric field is stimulated by a loop conductor and the magnetic field is stimulated by a second loop conductor located in close proximity.

7. A radio antenna according to Claim 6 in which the conductors are firstly the outer screen and secondly the inner conductor of a loop of coaxial cable.

8. A radio antenna according to Claim 6 in which more than one turn is used for either or both of the said conductor loops.

9. A radio antenna according to any one of the Claims 1 to 8 used in conjunction with a conducting sheet or mesh held in a position to obstruct radiation in an unwanted direction or to improve radiation by reflection in a preferred direction, or directions.

10. A radio antenna according to any of the Claims 1 to 9 which has a remotely controlled trimmer capacitor in order to vary the frequency of operation from a distance.

11. A radio antenna which is composed of a two or more individual antennas according to any of the Claims 1 to 10 which are arranged to interact so as to produce a shaped pattern of directivity as in a phased array.

12. A radio antenna according to any of the Claims 1 to 11 being located near other metal rods or arrays of such conductors in order to parasitically affect the radiation in directivity as in the previously known science of parasitic arrays.

13. A radio antenna according to any of the Claims 1 to 10 located at the focus of a parabolic reflector whether fixed or steerable for enhancement of transmission or reception in a designed direction or directions.

14. A radio transmitting or receiving antenna which is physically compact being typically no more than three percent of a wavelength in any dimension the antenna comprising two electrical conducting surfaces across which radio frequency electric field lines each carrying half the power are arranged to cross radio frequency magnetic field lines carrying the remaining half power to thereby synthesise and propagate radio waves, a low impedance feeder from a transmitter feeds through a set of coils wired in parallel and lying in a toroidal shape to create a circular RF magnetic field and then passes to a low impedance tap on a resonant autotransformer used to connect a high RF voltage and create a curving electric

field across the interaction zone in the volume between the two electrical conducting surfaces.

15. A radio antenna constructed as described herein and exemplified with reference to the drawings.